12.0 UTILITIES & INFRASTRUCTURE

12.1 WATER SUPPLY SYSTEM

The Lowell water department was formed in 1872 and relies solely on the Merrimack River for supply. Conventional treatment is used with, sand, dual and carbon media filtration. Approximately 15 mgd (million gallons per day) are pumped with a maximum capacity of 30 mgd. The Lowell Regional Water Utility (LWRU) is responsible for supplying all of Lowell residents with safe potable water. The utility also supplies water to Dracut, Tyngsboro, East Chelmsford on a daily basis, as well as Tewksbury, North Chelmsford and Chelmsford Center Water on an as needed basis from its facility on Pawtucket Blvd. The other major user of water from the Merrimack is the Consolidated Power Company, which withdraws water to generate hydroelectric power The LRWU system includes two underground storage tanks with a capacity of 11 million gallons which are located on Christian Hill in the Centreville section of the city, the Stackpole, Newbridge, Tenth Street booster Stations as well as two free standing storage tanks located on Wedge St (1mg capacity). In the Highlands section of the city and on Fox St. (.4mg capacity.) located on Christian Hill. There are over 210 miles of water mains consisting mostly of 6-inch cast iron pipe supported by 8,12 and 24-inch cast iron transmission mains; Most of the mains are between 60 and 100 years old. Lowell has 2200 hydrants and 22,000 house, business and industrial services. Approximately 15% of the service pipes where determined to be lead or galvanized iron, we have been replacing them as quickly as possible.

The Merrimack River provides ample water for Lowell's existing and future water supply demands. Significant improvements have been made all along the Merrimack River Utility Basin, whereas twenty years ago fish were hard to find along the river. Today, trout, bass and pan fish can be found in abundant supply. Water quality has improved and the river has been designated a class (B) river which means it is safe for fishing, swimming and boating. As an aside the Utility sponsors a 2-mile race in the river every Fourth of July, however as development continues in the basin, major efforts are needed to manage existing and potential contamination sources.

Much of this clean up effort gained important significance when in 1988 the Environmental Protection Agency (EPA) established the Merrimack River Initiative. This program coordinates clean up efforts between New Hampshire and Massachusetts. Since its inception, millions of dollars have been spent to update municipal sewage treatment facilities and to educate the public on the importance of water to prevent further degradation of the Merrimack River. This federal effort has trickled down to the local level where various students from area schools have been participating in water quality monitoring programs. Continued clean up of the Merrimack and Concord Rivers will result in expanding recreational opportunities for area residents and stimulating further economic development.

The Utility is in the midst of a 12.6 million dollar upgrade which will keep in compliance with all present and future regulations as well as completely automate all the operations of the treatment plant.

12.2 SEWAGE SERVICE

Lowell's existing sewer system consists of approximately 210 miles of sewer lines and 27 miles of drains. Eighty-eight percent of the sewers are combined sewers, carrying both drainage and sewerage. Problems inherent with combined sewer systems include raw sewage being dumped directly into the river during heavy rain periods. When the sewage treatment facility fills beyond capacity, the water is discharged directly into the Merrimack River completely bypassing the

treatment plant. During wet periods of the year, this set up contributes to water pollution. The problem -- known as combined sewer overflow -- also exists in Nashua and Manchester, NH, and downstream in Lawrence and Haverhill, where the Merrimack is used as a public drinking water supply. All five communities are under orders from the federal Environmental Protection Agency to fix the overflows, which are the result of storm water and wastewater flowing into the same systems. In 2001, representatives from the five towns held a press conference to announce the formation of the Merrimack CSO Coalition, a collective effort to influence federal regulatory agencies to help the region deal with the overflows.

Lowell has a 32-mgd design capacity conventional activated sludge and treatment plant on Duck Island, serving the City of Lowell and the Towns of Dracut, Tewksbury, and a portion of Tyngsborough, a total population of 158,000 persons. The plant has the capacity to handle a peak flow of 64 mgd, and a peak primary flow of 110 mgd. In actual practice, a peak flow of only 50-mgd can be optimally treated to secondary and 100 mgd to primary standards.

Flow to the treatment plant travels through major interceptors along the Concord and Merrimack Rivers. The plant houses a computer that monitors the treatment processes and controls the amount of wastewater that reaches the plant to prevent overload. The system incorporates an override function so that the operator may manually control processes and operates equipment.

12.3 Combined Sewer Overflow

Combined sewer overflows are sewer systems that were designed to carry sewage and storm water in the same pipe to a sewage treatment plant. After heavy rainfall or snowmelt events, the wastewater volume is often more than the sewer system or treatment plant can handle. For this reason, combined sewer systems were designed to overflow after rain events and result in excess wastewater being discharged directly into rivers, lakes and coastal areas. The wastewater the CSOs carry not only contains storm water but also untreated human waste and industrial waste, toxic materials and floating debris.

CSO discharges have widespread impacts across New England, causing beach closings, shellfishing restrictions and limiting fishing and other recreational activities. In some instances, CSOs discharge raw sewage into rivers that also serve as primary sources of drinking water. Exposure to viruses, bacteria, pathogens and other CSO-related pollutants or toxics is an obvious public health concern. Swimmers, canoeists, and others exposed to CSO contaminants are vulnerable to gastroenteritis, respiratory infections, eye or ear infections, skin rashes, hepatitis and other diseases. Children, the elderly, and people with suppressed immune systems are especially vulnerable. Wildlife and aquatic habitat are also adversely affected by CSO pollutants which lead to higher water temperatures, increased turbidity, toxins and reduced oxygen levels in the water.

CSO impacts on the Merrimack River, a primary drinking water source for the City, are particularly serious. CSO discharges are a major pollution source to the Merrimack River and are a big reason why it routinely violates water quality standards after heavy rains. Lowell's nine CSO outfall pipes alone discharge more than 10 million gallons of combined sewage and storm water into the Merrimack during a typical one-inch rainstorm.

In January of 2001, Lowell received a $5.85 million zero-interest loan to increase the capacity of its wastewater system from the federally subsidized Clean Water Act State Revolving Loan Fund. Also last year Congress passed the fiscal year 2002 Energy and Water Appropriations Conference Report, which contained $500,000 for the U.S. Army Corps of Engineers to conduct a multi-state

study of water pollution and potential pollution control measures for the Merrimack River Basin. Lowell also received $350,000 in EPA State and Tribal Assistance Grants to help solve combined sewer overflow (CSO) infrastructure problems.

12.4 Private Utilities

Electric power is provided by Massachusetts Electric, a division of National Grid. Local telephone service is provided by Verizon. Customers can choose their long distance service from a variety of providers. Internet service is provided over Verizon's copper and fiber optic lines. Broadband service, which allows faster connections, utilizes these same lines. Natural Gas is provide by Keyspan to 28,529 accounts. Every section of Lowell has gas mains, although a few blocks in some residential neighborhoods do not have gas mains in them.